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**Peter W-K Li\***, University of California, Department of Mathematics, Irvine, CA. *What do we know about open manifolds?*.

An open manifold being non-compact may have infinite topology. The first obstacle towards the understanding of the structure of a complete open manifold is to determine if it has finitely many ends (infinities). In this talk, I will describe an analytic method of detecting the number of ends. In particular, the effectiveness of this method will be demonstrated on various classes of manifolds. Moreover, rigidity type theorems can be obtained in some cases. (Received April 23, 2009)